REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated October 7, 2003 (U.S. Patent Office Paper No. 12). In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 1 to 7 are pending in this application. Claim 1 is being amended to more particularly point out and distinctly claim the subject invention. Applicant hereby submits that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

Claims 1 to 5 were rejected under 35 U.S.C. §102(b) as being anticipated by Lockhart et al. (Nature Biotechnology. Vol. 14, pp. 11675-1680 1996), hereinafter "Lockhart".

Claims 1 to 7 were rejected under 35 U.S.C. §102(b) as being anticipated by Schena et al. (Science, vol. 270, pp. 467-470 1995), hereinafter "Schena".

Claims 1 to 7 were rejected under 35 U.S.C. §102(e) as being anticipated by Slater et al., U.S. Patent No. 6,448,387, September 10, 2002, hereinafter, "Slater".

Applicants respectfully traverse the above-noted rejections. Regarding the response filed on July 23, 2003, the Examiner indicated that the response had been considered but was not deemed to be persuasive. He alleged that "Hybridization level is a measure of a similarity score in that it represents a measure of the level of complementaries between a probe and a target."

In contrast, the present invention as now recited in claim 1 is directed to a method for displaying results of a hybridization experiment in which a plurality of probe biopolymers immobilized on a biochip are hybridized to a sample biopolymer. The method comprises the steps of determining information obtained in the hybridization experiment about a hybridization level for each of the probe biopolymers; determining a similarity score representing a similarity between a base sequence of at least one of the probe biopolymers and a base sequence of at least

one other of the probe biopolymers; and displaying the information about the hybridization level for each of the probe biopolymers together with the similarity score so as to provide at least one of a visual confirmation of similarities between the base sequences of corresponding biopolymers used in the hybridization experiment and a visual indication of unexpected or improper hybridization.

As is known in the art, hybridization is defined as: The process of joining two complementary strands of DNA or one each of DNA and RNA to form a double-stranded molecule. In the specification on page 3, lines 1 to 5, the level of hybridization is described as: "... hybridization patterns indicating the levels of hybridization for each DNA sequence on each of the biochips."

Throughout the specification, the similarity score as recited in the claims is defined as being calculated "from the base sequences of subject probe biopolymers" or that it represents "the similarity of base sequences between each of the probe biopolymers" or that it is calculated "calculated from the base sequence information of the subject probe biopolymers." More specifically, in at least one embodiment, the specification discloses "[i]n step 202, the similarity scores are calculated between two DNA probes of the subject DNA probes for all of possible combinations. The similarity scores are calculated between the same DNA probes, as well as between two different DNA probes." Further, the specification recites that "[h]omology scores (*i.e.*, similarity scores) are determined according to the Smith-Waterman method using the DNA sequences of the DNA probes designated by the DNA probe IDs 1 to 5 that are retrieved in step 201."

Among the main features of the present invention, as indicated on page 4, lines 19 to 23, the specification states that "At present, no practical approach is known for determining whether a probe biopolymer has been accurately hybridized to a sample biopolymer of interest, and accordingly, there is a need for such a method." The present invention is specifically directed to providing such a method for displaying information concerning the accuracy of hybridization experiments using biochips is a manner that is visually easy to understand.

Lockhart, in its Figs. 3 and 4, merely teaches that hybridization intensities are quantitatively related to target concentrations for different gene targets. Specifically, this reference only teaches analyzing hybridization patterns and intensities on the array. Lockhart

does not disclose, teach or suggest at least displaying the "similarity score" along with the hybridization levels or intensities as disclosed or claimed for the present invention.

In the reference of Schena, the reference table 2 merely represents "Gene expression monitoring by microarray and RNA blot analysis" and that "gene expression" is defined as "the transcription, translation, and phenotopic manifestation of a gene". Although table 2 of Schena comprises a comparison between the gene expression of different genes in microarray and in RNA blot, Schena does not disclose, teach or suggest at least displaying any type of similarity score obtained for the genes in accordance with the method as defined and claimed for the present invention.

The Slater reference discloses immobilizing target molecules on an array, providing probes to hybridize with the target molecules and displaying the hybridization intensities of the target. The array is scanned to produce a digital image representing the hybridization intensities thereon, as shown in Figure 3 and described in sections Examples 1, 2, and 3. The Slater reference also fails to disclose, teach or suggest at least displaying a "similarity score" of the targets immobilized on the array together with the hybridization intensities similar to that disclosed or claimed for the present invention.

Consequently, none of the cited references as discussed above can anticipate each and every feature of the present invention as claimed.

CONCLUSION

In view of all the above, Applicant respectfully submits that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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